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ABSTRACT

This paper uses the Chain of Response Model (CRM) to help explain retention in the community college population. In the CRM, the student's decision to remain at an educational institution is not an isolated act, but rather the result of a complex chain of responses based on her/his cognitive evaluation of the present situation. The authors applied a modified version of the CRM model to persistence patterns of community college students of all ages. The purpose of this study was to test the applicability of a modified CRM to the community college student, as well as its utility in explaining motivation for continuing at an educational institution. Data were garnered from a 4-year cohort study conducted at a multi-campus community college in a large metropolitan area. Three scales and one single-item measure were used on 1,203 observations to assess path relationships. The 3 scales include: 4 items measuring attitudes toward education; 13 items measuring barriers and opportunities; and 13 items measuring expectations and goals. A single-item measure of participation was utilized as the dependent variable. There are positive paths for all the variables included in the model, each being statistically significant at the 0.05 level. (NB)

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Reasons for Staying: A Test of the Chain of Response Model Among Community-College Students

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ABSTRACT

Student retention is a critical issue in post-secondary education, particularly due to the increased competition for students over the past decade. A model originally developed to describe participation in adult education, the Chain of Response Model (CRM) (Cross, 1981), may have utility in describing the reasons for retention among all college students. The CRM is tested using structural equation modeling with data from a 4-year cohort study conducted at a large multiple-campus community college. Administrators, faculty and researchers at educational institutions can utilize the findings to increase their understanding of student retention processes at their own institution.

Student retention in post-secondary institutions is a critical issue for both 2-year and 4-year institutions of varying sizes (Horn & Carrol, 1998). For example, a 1998 report from the National Center on Educational Statistics concludes that 42% of students enrolled at a community college leave prior to the beginning of their second year (NCES, 1998). Developing a greater understanding of why some students stay, while others opt to leave the institution is of critical importance to both educational administrators and educational researchers who may be interested in understanding if there was a cognitive or affective influence on these students in terms of their enrollment. Moreover, since the majority of research in the area of student retention centers around undergraduates at 4-years colleges and universities (e.g., Berger, 1997; Braxton, Vesper & Hossler, 1995; Milem & Berger, 1997), it is imperative that the community college population be studied to discover the constellations of characteristics that are unique to its students.

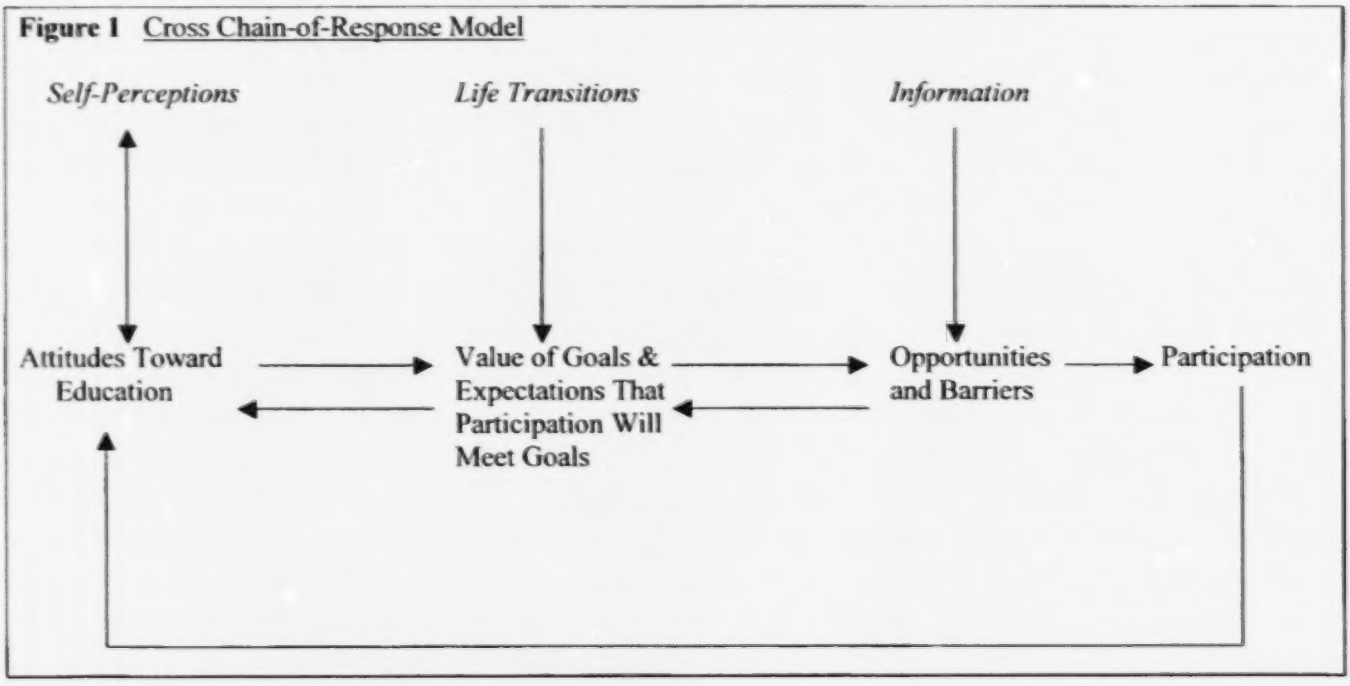
Conceptual Background

Most of the literature on student persistence has been designed within the framework of Tinto's (1993) model of student persistence. The Chain of Response Model (CRM), originally developed for explaining participation in adult educational activities, represents educational participation as a result of a complex "chain" of responses to a variety of conditions and the way in which these conditions are perceived by different individuals (Cross, 1981). The model seems uniquely suited to explain retention in the community college population. Of course, many community college students are adult learners, but even those who are younger or who are entering college directly out of high school share difficulties and similar life experiences which can influence the decision to remain at an educational institution.

In the CRM, a student's decision to remain at an educational institution is not an isolated act, but is the result of a complex chain of responses based on her/his cognitive evaluation of the present situation. The main constructs in the model are self-evaluation and attitude toward education. The self-evaluation component includes an individual's sense of their characteristics, as well as their self-perceived ability to accomplish

objectives and goals in life. Attitude toward education is defined as the expectations an individual has regarding the value of education and what subsequenct outcomes result from obtaining an education. These internal factors interact with the expectations associated with continued participation at the educational institution and other external factors such as individual life events that may be barriers to continuation at the educational institution. Hence, the interplay between internal processes and external forces are intrumental in determining the actions of individuals. More specifically, the combination of the aforementioned factors can impact students continued matriculation with an educational institution. In the original conception of the CRM – seven (7) variables are included. See Figure 1 below for the complete model.

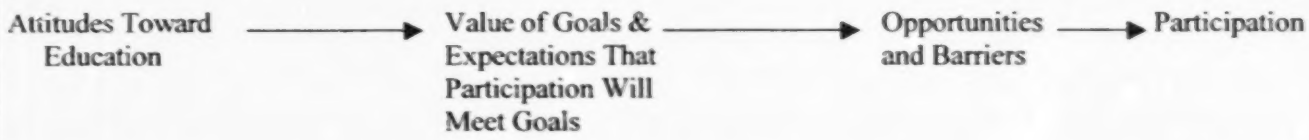
Figure 1 Cross Chain-of-Response Model



For our study, we do not limit ourselves the adult population as Cross had originally formulated. Rather, we apply modified version of CRM model to the persistence patterns of community-college students of all ages. This decision was made for two important reasons. First, the model as seen in the figure above contains many theoretically vague bi-directional paths and loops. This lack of conceptual clarification fails to address how

these processes are influenced and how they impact others. Since we know of no empirical test of the model to exist, we felt there was a need to begin with a simpler, more elegant model. This point is particularly pertinent when testing a model to a new contextual construct. Our second reason for modifying the model was one of practicality. The data gathered for this analysis was part of an on-going cohort study, which was not originally designed for testing the CRM. We include many of the model's variables that could be measured by the existing data and excluded others. Exclusions were based primarily on the unavailablity of information needed for some of the CRM components. As a result, Figure 2 describes the modified model that was tested in the current investigation.

Figure 2 Modified Chain-of-Response Model


Attitudes Toward Education
Value of Goals & Expectations That Participation Will Meet Goals
Opportunities and Barriers
Participation

Research Question

To date, a paucity of research has examined the underlying processes of student retention amongst community-college students. The purpose of this work is to test the applicability of a modified CRM to the community college student and its utility in explaining motivation for continuing at an educational institution.

Method

Data for the current investigation was garnered from a 4-year cohort study conducted at a multi-campus community college in a large metropolitan area. Students were administered a battery of questions when they

entered the institution in the fall of 1998. These variables included their assessment of their skill level, their educational expectations, and a variety of other items about motivations or reasons to complete their education. Each semester, students were questioned about the progress they had made toward their educational goal and their level of satisfaction with the institution. If a student decided not to continue, they were sent an alternative set of questions regarding their decision to leave, their perception of their educational progress, and their level of satisfaction with their college experience. Variables for those students who remained continuously enrolled, as well as those who were not enrolled will be used to measure the components of the modified CRM. We evaluate the model using structural equation estimation procedures that assess the model's consistency with the data. The results of this investigation provide an empirical test of a conceptual model of retention which to date has not been utilized for this type of student.

Measures

The four variables included in the model were measured by data from a cohort study of first-time community college students. Three scales and one single item measure were used to assess the path relationships. The three scales include: Four items measuring Attitudes Toward Education, 13 items measuring Barriers and Opportunities where students indicated whether they made no, some, or a lot of progress toward a variety of educational goals and 13 items measuring Expectations and Goals where students indicated their level of satisfaction with a variety of services and educational practices. In all cases, higher scores were indicative of more positive attitudes, perceptions of opportunities, and greater progress towards goals. See the three charts on the next pages for more specific information on the scales, their items, and their reliability estimates. A single-item measure of Participation was utilized as the dependent variable.

Results

Correlations between the four main variables were computed. The number of observations included in the study was 1203. Because of the ordinal nature of the data, Spearman Correlations were utilized for this

Chain-of-Response Model:

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Attitudes Toward Education

1. Long-term educational goal
2. Father's highest educational level acheived
3. Mother's highest educational level achieved
4. High school gpa

Scale Reliability

Standardized ALPHA= .3160

* All correlations were corrected for attenuation due to error of measurement prior to being included in the path analysis.

This scale was then included in the path model testing the modified Chain-of-Response Model for Measuring the Variable:

Attitudes Toward Education

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Barriers and Opportunities Scale

1. I feel a sense of belonging
2. OCC shows concern for me as an individual
3. Faculty are understanding of students
4. There are enough convenient ways of paying
5. Quality of the Classroom instruction is excellent
6. Faculty helped me to achieve my educational goals
7. Classes are scheduled at convenient times
8. Campus facilities are adequate for studying needs
9. OCC has a good academic reputation
10. Faculty see interested in my academic progress
11. College billing procedures are reasonable
12. OCC staff are helping me reach my educational goal
13. There are enough opportunities to meet with faculty outside of class

This scale was then included in the path model testing the modified Chain-of-Response Model for Measuring the Variable:

Perception of Opportunities and Barriers

Scale Reliability

Standardized ALPHA= .8895

* All correlations were corrected for attenuation due to error of measurement prior to being included in the path analysis

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Expectations Scale

1. Becoming an effective team member
2. Interacting with people from cultures different from my own
3. Improving my math skills
4. Improving my ability to make better decisions
5. Improving my speaking/communication skills
6. Improving my reading/comprehensic.. skills
7. Learning to think or reason
8. Developing problem-solving skills
9. Improving my study skills
10. Developing openness to new ideas
11. Broadening my intellectual interests
12. Improving my writing skills
13. Developing effective job-seeking skills

This scale was then included in the path model testing the modified Chain-of-Response Model for Measuring the Variable:

Expectations that Participation Will Meet Goals

Scale Reliability

Standardized ALPHA= .8892

* All correlations were corrected for attenuation due to error of measurement prior to being included in the path analysis.

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analysis. These correlations were then entered into a statistical program called PACKAGE. It is an ordinary least-squares path analysis program developed at Michigan State University. The program computes the multiple correlations for all endogenous variables and generates the reproduced correlations using the path model and the estimated path coefficients. The Path procedure of PACKAGE generates the errors between the predicted and observed values, and as well as a sampling error analysis. An overall chi-square test is computed to assess the overall fit of the data to the model.

After the correlations were entered and the model parameter specified, each correlation was put through a procedure to correct for attenuation due to error in measurement. Accurate estimation in path analysis requires either perfect measurement (true only of theoretical studies) or knowledge of the reliability of each variable so that the attenuation bias due to random error of measurement can be corrected. The reliability figure for each of the scales was input to enable this correction.

The figure on the following page contains the results of the path analysis. Consistent with the CRM, there are positive paths for all of the variables included in the model. Each of the paths is statistically significant at the .05 level. The confidence intervals are included below each path coefficient. The model does provide some explanation as to the differences in student persistence. Students who have more positive attitudes about education are more likely to perceive greater progress towards their educational goals. Those who perceive greater progress tend to see greater opportunities and fewer barriers to continuing their education, and as a result persist to a greater degree. The overall chi-square is statistically significant (Chi-Square = 14.55, df 3) and indicates that the data is not consistent with the model. Of course, the significance test is always impacted by the sample size, and with one so large, any deviation in the data from the model is likely to cause a significant difference. The CRM has provided some explanatory utility, but is far from providing a complete picture for what motivates student retention at the community college.

Chain-of-Response Model:

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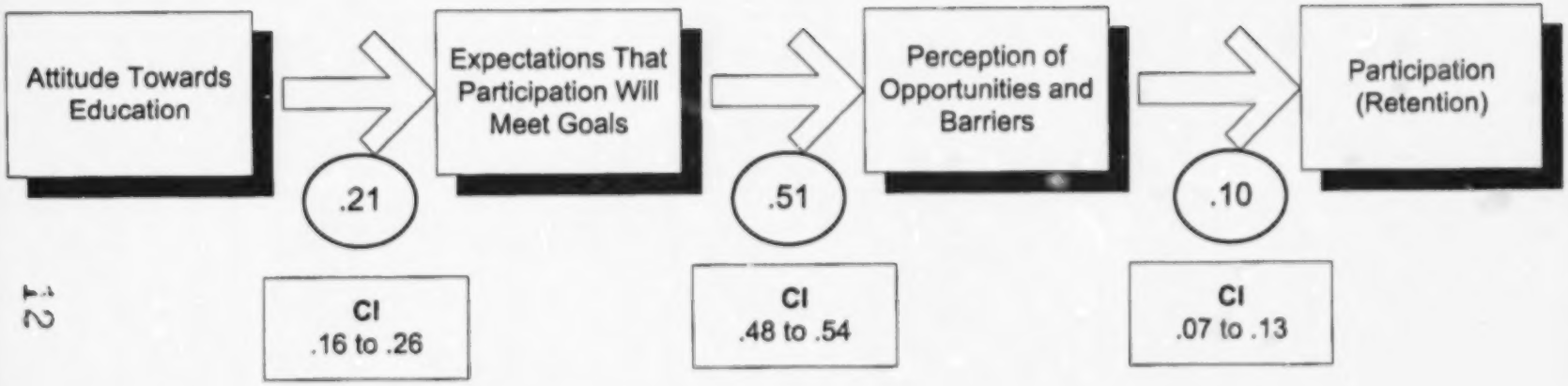

Test of the Overall Model:

Chi-Square = 14.55
DF = 3
N = 1203

Discussion & Implications

The assessment of progress toward goals and perceptions of educational barriers and opportunities were related to a student's decision to continue participating in the educational process at the Community College. Each of the path coefficients in the causal string were statistically significant at the .05 level. Although some of the variance in participation was explained, there are clearly additional variables involved with the process. It may be that the full CRM would provide a better method of estimating the mechanisms influencing community college retention. In addition, because of the fact that the measurements employed in this investigation were created from a pre-existing questionnaire, it is likely that there were some problems with the correspondence of the concepts to their operationalization in the analysis. Future investigations may be directed at attempting to more closely match the measures by producing an instrument designed for testing the full and modified model specifically.

The overall chi-square indicated that the data was not consistent with the model as specified in the analysis. In path modeling, the use of the chi-square is rather counterintuitive. Here, a non-significant result is desired because this means that there is no difference between the data and the model that has been specified. In the current investigation, there was a significant difference meaning that for this data, the model was not correctly specified. Of course, the significance test is sensitive to the number of observations in the analysis. With 1203 students in the sample, any deviation between the model and the data is likely to be statistically significant. This overall finding should not obscure the individual path coefficients among the model's variables.

Of course, the fact that the data did not fit the model perfectly indicates that there is likely to be additional variables which contribute to a student's decision to persist or not to persist in their education. Other variables, such as a more direct measure of motivation, certain demographic variables, and academic performance variables were not included. In addition, the measurement of Educational Attitudes was

particularly weak in this analysis. No direct attitudinal questions were asked of the student participants. Future investigations may seek to include additional variables, and more precise measurement of variables already in the model.

The results of this study may help to identify students who are more likely to leave. This would enable some type of intervention to increase their chance of being retained. There is still a great deal we so not know, but with each investigation we learn just a bit more about the mysteries of student retention.

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